

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A catheter for a medical apparatus, comprising:
an inner catheter including a wire coil disposed around an inner tube from a proximal region of the inner tube to a distal region of the inner tube, the wire coil having an intermediate region with a closed-coil structure and at least one of a distal region and a proximal region with an open-coil structure, an outer tube disposed around at least the intermediate region; and
a sheath disposed around at least a portion of the inner catheter, the sheath being retractable in a proximal direction relative to the inner catheter.
2. (Previously presented) The catheter according to claim 1, including a lubricious coating on an outer surface of the inner catheter.
3. (Previously presented) The catheter according to claim 1, including a lubricious fluid in the annulus between the sheath and the inner catheter.
4. (Previously presented) The catheter according to claim 1, wherein the sheath comprises a thermoplastic elastomeric material.
5. (Previously presented) The catheter according to claim 1, wherein a silicone material is disposed between the outer tube and the sheath.
6. (Canceled).
7. (Currently amended) The catheter according to claim 1 [[6]], wherein the distal end of the inner tube extends to a point distal of the distal end of the wire coil.

8. (Currently amended) The catheter according to claim 1 [[6]], wherein the inner tube defines an inner guidewire lumen.

9. (Canceled).

10. (Previously presented) The catheter according to claim 1, wherein the wire coil has an open-coil structure in both the distal region and the proximal region.

11. (Previously presented) The catheter according to claim 10, wherein the wire coil defines a liquid flow path from the proximal end to the distal end of the catheter, including a radially-extending portion through the open-coil structure.

12. (Previously presented) The catheter according to claim 11, wherein the liquid flow path is an annular flow path bounded by the inner tube and the wire coil.

13. (Previously presented) The catheter according to claim 1, wherein the outer tube is a shrink-tube constraining the wire coil.

14. (Previously presented) The catheter according to claim 13, wherein the outer tube comprises PTFE.

15. (Currently amended) The catheter according to claim 1 [[6]], wherein the inner tube defines a medical-device-receiving annulus around a distal portion of the inner tube, said distal region being distal of the distal end of the wire coil and proximal of the distal end of the inner tube.

16. (Previously presented) The catheter according to claim 1, further comprising an atraumatic tapered tip positioned at the distal end of the catheter.

17. (Previously presented) The catheter according to claim 16, wherein the tip is formed as part of the sheath.

18. (Previously presented) The catheter according to claim 16, wherein the tip is attached to the inner catheter.

19. (Previously presented) The catheter according to claim 18, wherein the tip comprises polyurethane.

20. (Previously presented) The catheter according to claim 1, including an actuating device connected to a proximal end of the inner catheter and the sheath, configured to retract the sheath in a proximal direction relative to the inner catheter.

21. (Previously presented) The catheter according to claim 20, including a medical device maintained in position between the sheath and the inner catheter, the medical device being releasable by retraction of the sheath in a proximal direction relative to the inner catheter.

22. (Previously presented) The catheter according to claim 21, wherein:
the medical device is held within the lumen of the sheath at a location distal of the distal end of the wire coil;
the medical device is maintained radially compressed in a first state by the sheath being disposed around at least a portion of the medical device;
during retraction of the sheath, the medical device is prevented by the wire coil from moving with the sheath in a proximal direction; and
when the sheath is retracted in a proximal direction relative to the inner catheter, the medical device is released for expansion to a radially less compressed state.

23. (Previously presented) The catheter according to claim 21, wherein the medical device is a self-expanding stent.

24. (Previously presented) A medical device delivery apparatus, comprising:
a catheter, including an inner catheter and a sheath, the inner catheter including an inner polymeric tube, a wire coil disposed about a portion of the inner tube, and an annular gap between the inner polymeric tube and wire coil, the wire coil including an open-coil structure in at least one of a proximal region and a distal region and a closed-coil structure in an intermediate region, the sheath disposed about the inner catheter; and
an actuating device connected to the catheter.

25. (Previously presented) The medical device delivery apparatus according to claim 24, wherein the catheter further includes an outer tube disposed about the wire coil.

26. (Previously presented) The medical device delivery apparatus according to claim 25, wherein the outer tube comprises polytetrafluoroethylene and is disposed tightly about the intermediate region of the wire coil.

27. (Previously presented) The medical device delivery apparatus according to claim 25, wherein the outer tube comprises polytetrafluoroethylene, and wherein a silicone coating is disposed over a surface of the outer tube.

28. (Previously presented) The medical device delivery apparatus according to claim 27, wherein the sheath comprises a thermoplastic elastomer and is in contact with the silicone coating.

29. (Previously presented) The medical device delivery apparatus according to claim 24, wherein a distal end of the wire coil is joined to a pusher element disposed about a distal region of the inner tube.

30. (Previously presented) The medical device delivery apparatus according to claim 29, wherein the pusher element includes a shoulder, a stent bed being defined along a distal region of the inner tube between the shoulder and a distal end of the inner tube.

31. (Previously presented) The medical device delivery apparatus according to claim 30, further comprising a tip attached to the distal end of the inner tube, a distal end of the sheath abutting the tip in a delivery apparatus insertion position.

32. (Previously presented) The medical device delivery apparatus according to claim 24, including a push rod disposed about the inner tube at a proximal region thereof, a distal end of the push rod joined to a proximal end of the wire coil.

33. (Previously presented) The medical device delivery apparatus according to claim 24, wherein a radiopaque marker band is attached to an inner surface of a distal end of the sheath.

34. (Previously presented) The medical device delivery apparatus according to claim 24, wherein the actuating device includes a first member connected to the inner catheter, and a second member connected to the sheath, the second member including a locking member configured to prevent relative movement between the inner catheter and the sheath.

35. (Previously presented) The medical device delivery apparatus according to claim 34, wherein an open position of the actuating device includes the first member spaced apart from the second member, and wherein a closed position of the actuating device includes the first member adjacent to the second member.

36. (Previously presented) The medical device delivery apparatus according to claim 34, wherein the second member includes a luer member in fluid communication with the inner catheter.